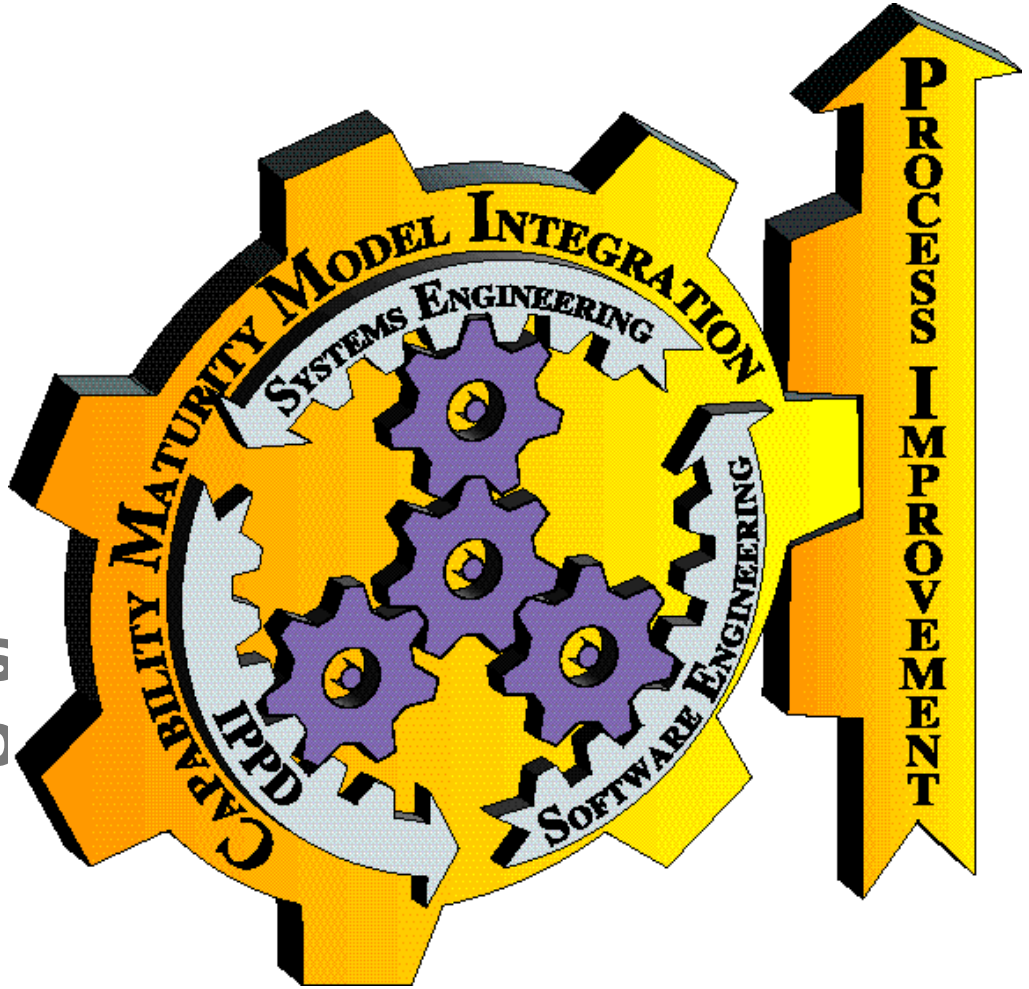
CMMI Project Status



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6 Nov 2000

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Agenda

- **Project History**
- **CMMI Structure**
- **Comparisons with SW-CMM v1.1, SE-CMM, and EIA/IS 731_**
- **Assessment Methodology**
- **Training**
- **Transition Timelines and Strategies**

What is a CMM?

- ***Capability Maturity Model*:**
  A reference model of mature practices in a specified discipline, used to assess a group's capability to perform that discipline
- **CMMs differ by**
  - **Discipline (software, systems, acquisition, etc.)**
  - **Structure (staged versus continuous)**
  - **How Maturity is Defined (process improvement path)**
  - **How Capability is Defined (institutionalization)**
- **"Capability Maturity Model®" and CMM® are used by the Software Engineering Institute (SEI) to denote a particular class of maturity models**

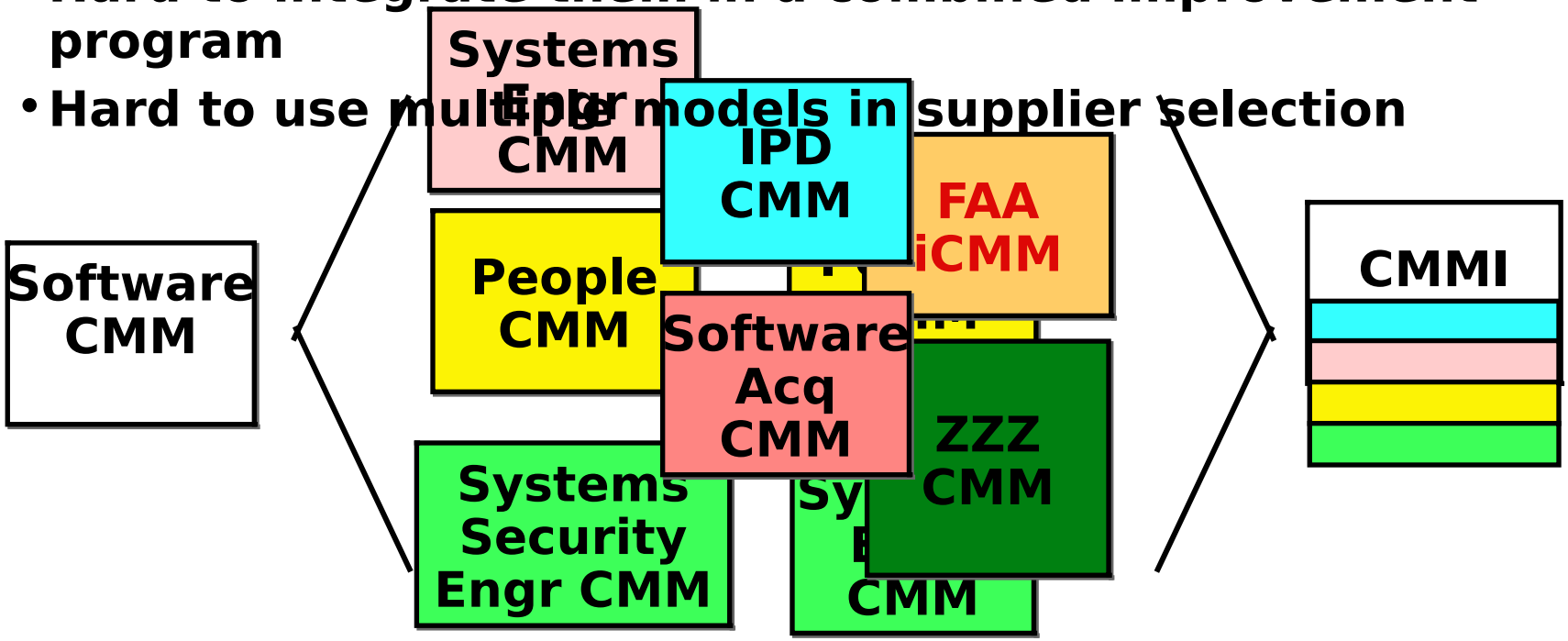
Capability Maturity Model®, CMM®, CMM Integration, and CMMI are service marks and registered trademarks of Carnegie Mellon University

Commonly Used CMMs

Software CMM	staged	software development
System Engineering CMM	continuous	system engineering
System Engineering Capability Model	continuous	system engineering
Software Acquisition CMM	staged	software acquisition
System Security Engineering CMM	continuous	security engineering
Personal Software Process	staged	individual software development
FAA-CMM	continuous	software engineering, systems engineering, and acquisition
IPD-CMM	continuous	integrated product development
People CMM	staged	workforce
SPICE Model	continuous	software development

What is the Problem?

- Different structures, formats, terms, ways of measuring maturity
- Causes confusion, especially when using more than one CMM
- Hard to integrate them in a combined improvement program
- Hard to use multiple models in supplier selection



The CMMI Project

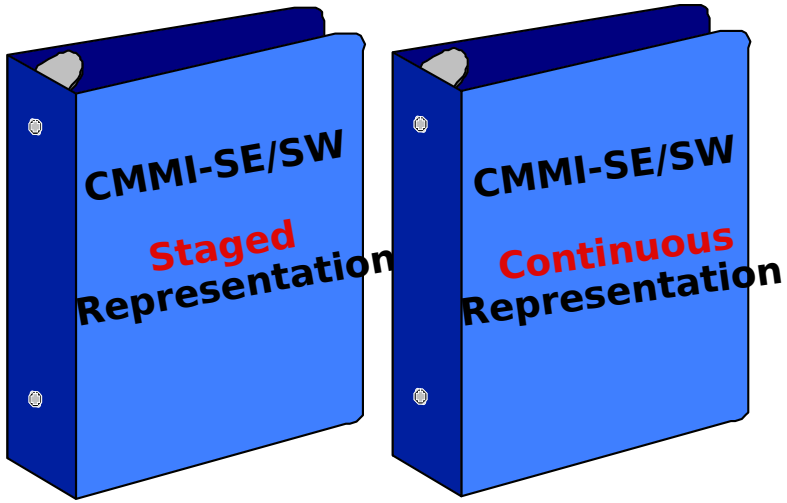
- **DoD sponsored collaboration between industry, Government, academia**
- **Over 100 people involved**

- **U.S. Army, Navy, Air Force**
- **Federal Aviation Administration**
- **National Security Agency**
- **Software Engineering Institute**
- **ADP, Inc.**
- **AT&T Labs**
- **BAE**
- **Boeing**
- **Computer Sciences Corporation**
- **EER Systems**
- **Ericsson Canada**
- **Ernst and Young**
- **General Dynamics**
- **Harris Corporation**
- **Honeywell**
- **KPMG**
- **Litton**
- **Lockheed Martin**
- **Motorola**
- **Northrop Grumman**
- **Pacific Bell**
- **Q-Labs**
- **Raytheon**
- **Rockwell Collins**
- **Sverdrup Corporation**
- **Thomson CSF**
- **TRW**

CMMI Models

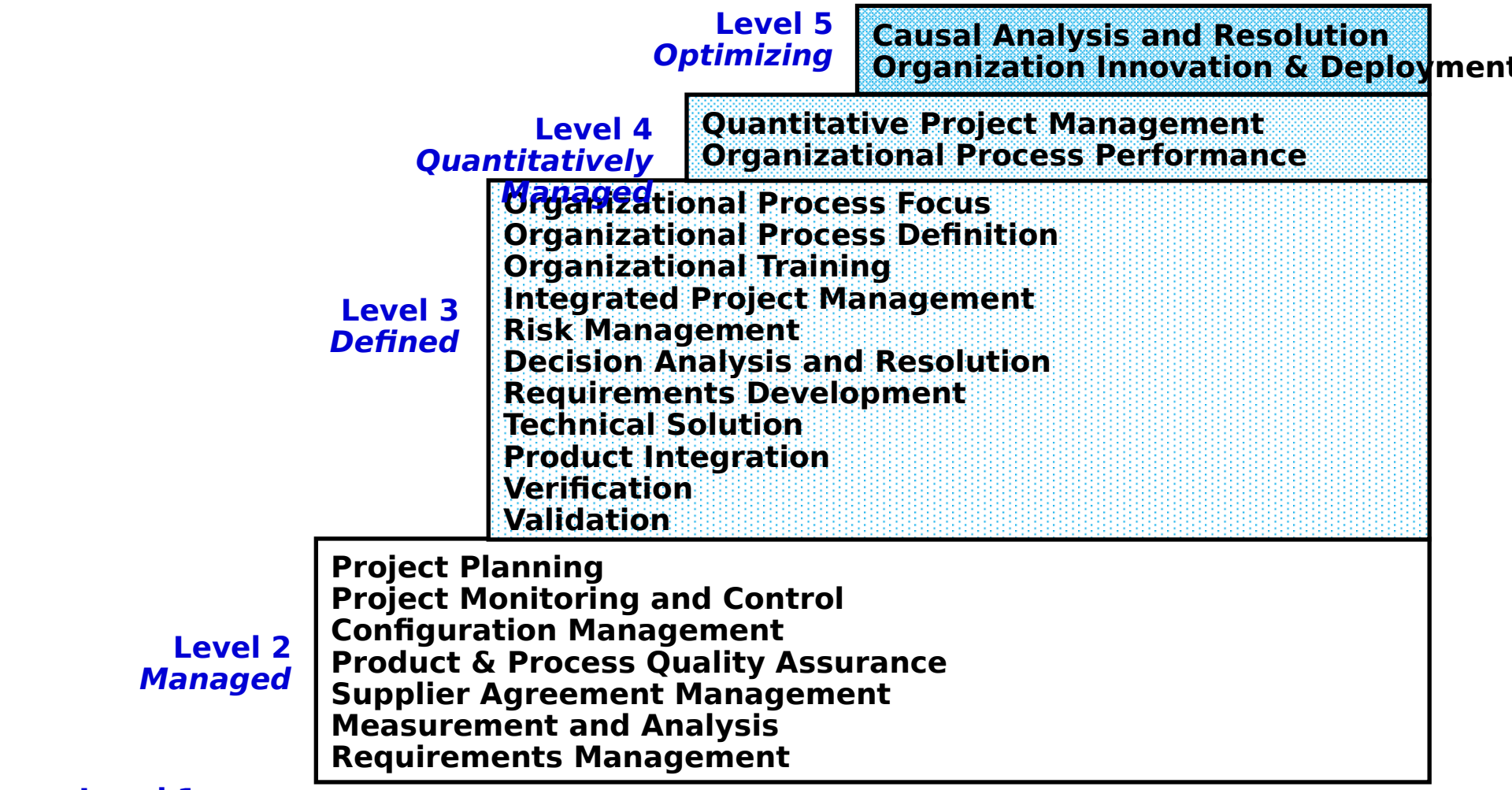
Source Models

- **Capability Maturity Model for Software V2, draft C (SW-CMM V2C)**
- **EIA Interim Standard 731, System Engineering Capability Model (SECM)**
- **Integrated Product Development Capability Maturity Model, draft V0.98 (IPD-CMM)**

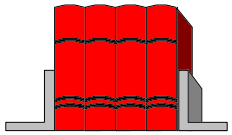


- **Combined System Engineering / Software Engineering model**
  - **IPPD version being developed**
- **Can be applied to:**
  - **Just the software engineering projects in an organization**
  - **Just the system engineering project in an**

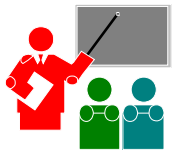
CMMI Process Areas - Staged Representation



Common Features For Each Process Area



- **Commitment to Perform** includes practices that ensure the process is established and will endure.
  - Establishing organizational policies and leadership.



- **Ability to Perform** includes practices that establish the necessary conditions for implementing the process completely.
  - Resources, organizational structures, and training.

- **Activities Performed** includes practices that directly implement a process area.
  - Developing plans and procedures, performing work, tracking work, and taking corrective actions as necessary.

- **Directing Implementation** includes measurement practices that are necessary to collect and analyze data related to the process.
  - Insight into the performance of the process.

- **Verification** includes practices that ensure compliance with the process that has been established.
  - Reviews and audits.

CMMI - Continuous Representation

Which Representation Should We Use?

- **The staged and continuous representations are equivalent but expressed in different ways**
  - **Equivalent staging defined**
- **Staged**
  - **Specific Process Areas for each Maturity Level**
  - **Guides incremental improvement by focusing attention on the next level's Process Areas**
- **Continuous**
  - **Each Process Area has Capability Levels**
  - **Organizations must decide your own improvement path**
    - » What level of capability is appropriate for each Process Area based on their business needs
- **Generally, you should keep the representation you started with**
  - **SW-CMM: staged; EIA 731: continuous**

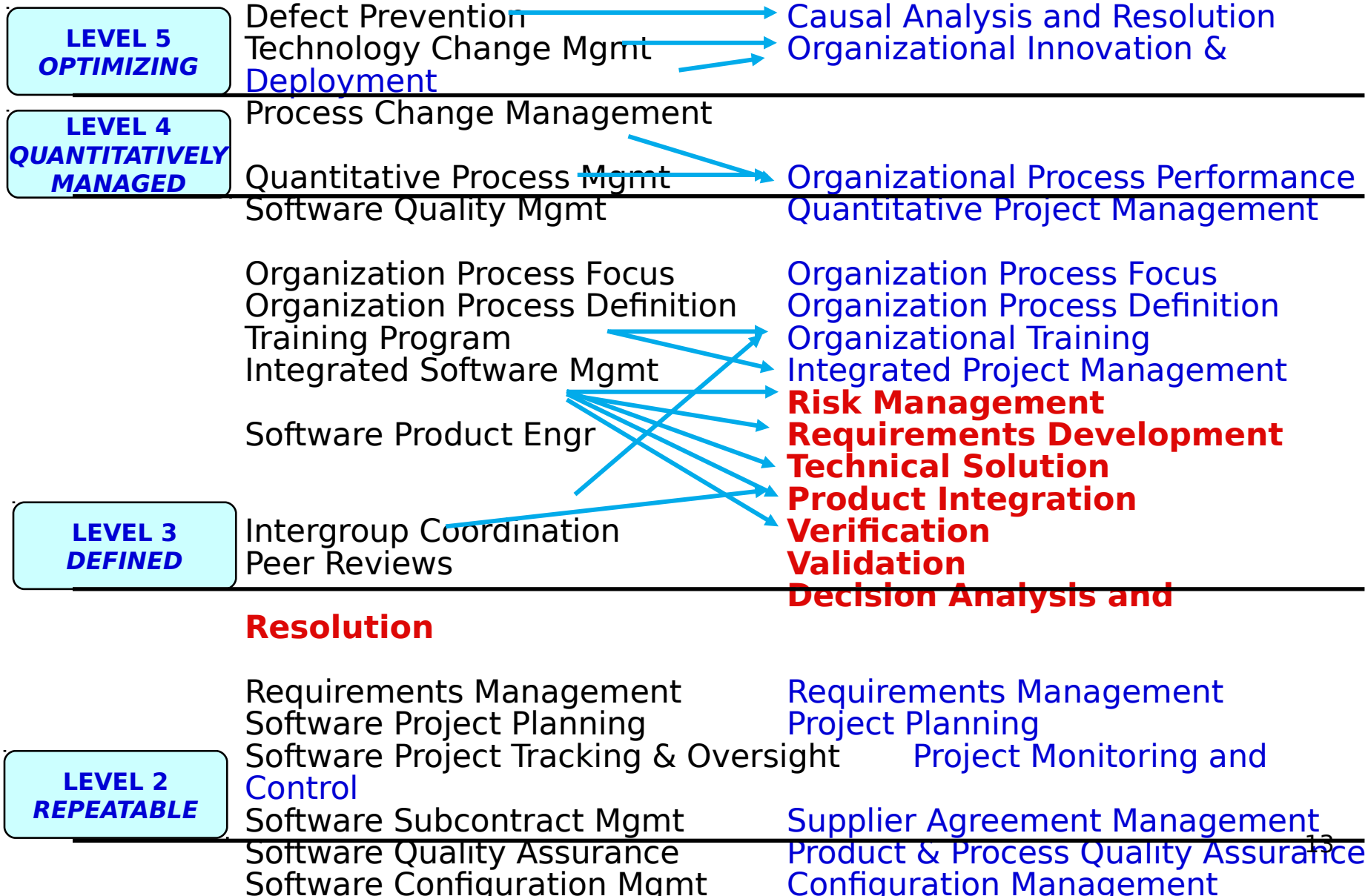
CMMI Model Components

- CMMI Models contain institutionalization (Generic) and implementation (Specific) parts:
- Front matter
- Process Areas that contain:

– Generic and Specific Goals	Required
– Generic and Specific Practices (in Common Features in staged representation)	Expected
– Subpractices – Notes – Discipline-specific amplifications	Informative

- Glossary and model scoping guidelines

SW-CMM v1.1 vs. CMMI
Process Areas

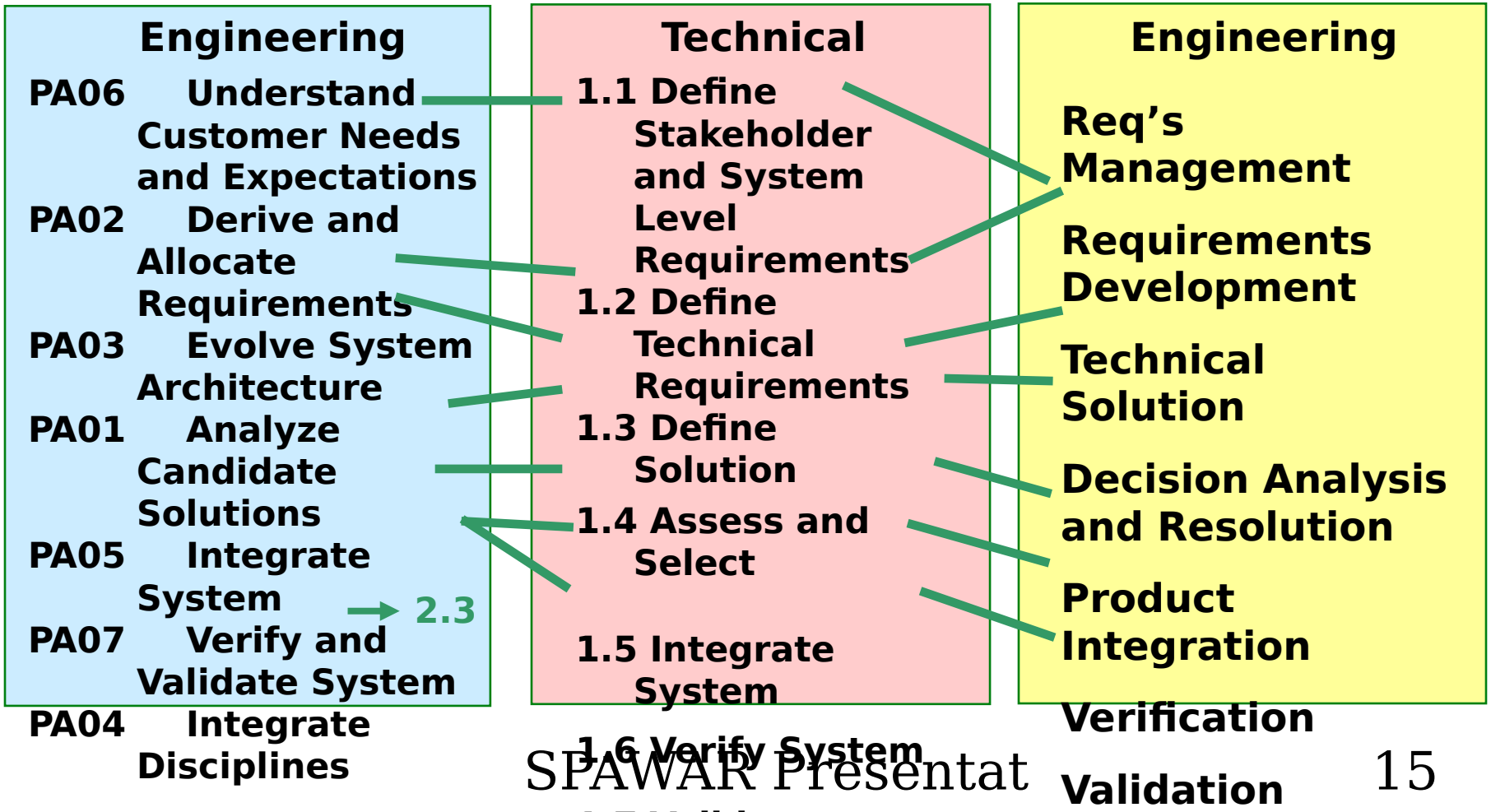


SW-CMM v1.1 vs. CMMI
Common Features

SW-CMM v1.1 Common Features	CMMI Common Features
Commitment to Perform	**Commitment to Perform**
Establish an Organizational Policy	Establish an Organizational Policy
Ability to Perform	**Ability to Perform**
	Plan the Process
Provide Resources	Provide Resources
Assign Responsibility	Assign Responsibility
Train People	Train People
Activities Performed	*(Specific Practices)*
Plan the Process	
Perform the Process	
Monitor and Control the Process	
	Directing Implementation
	Collaborate with Rel. Stakeholders
	Manage Configurations
	Monitor and Control the Process
Measurement & Analysis	
Measure the Process	
Analyze the Measurements	
Verifying Implementation	**Verifying Implementation**
Review with Org. Management	Review with [Higher-Level] Mgt
Review with Project Management	
Objectively Verify Adherence	Objectively Verify Adherence

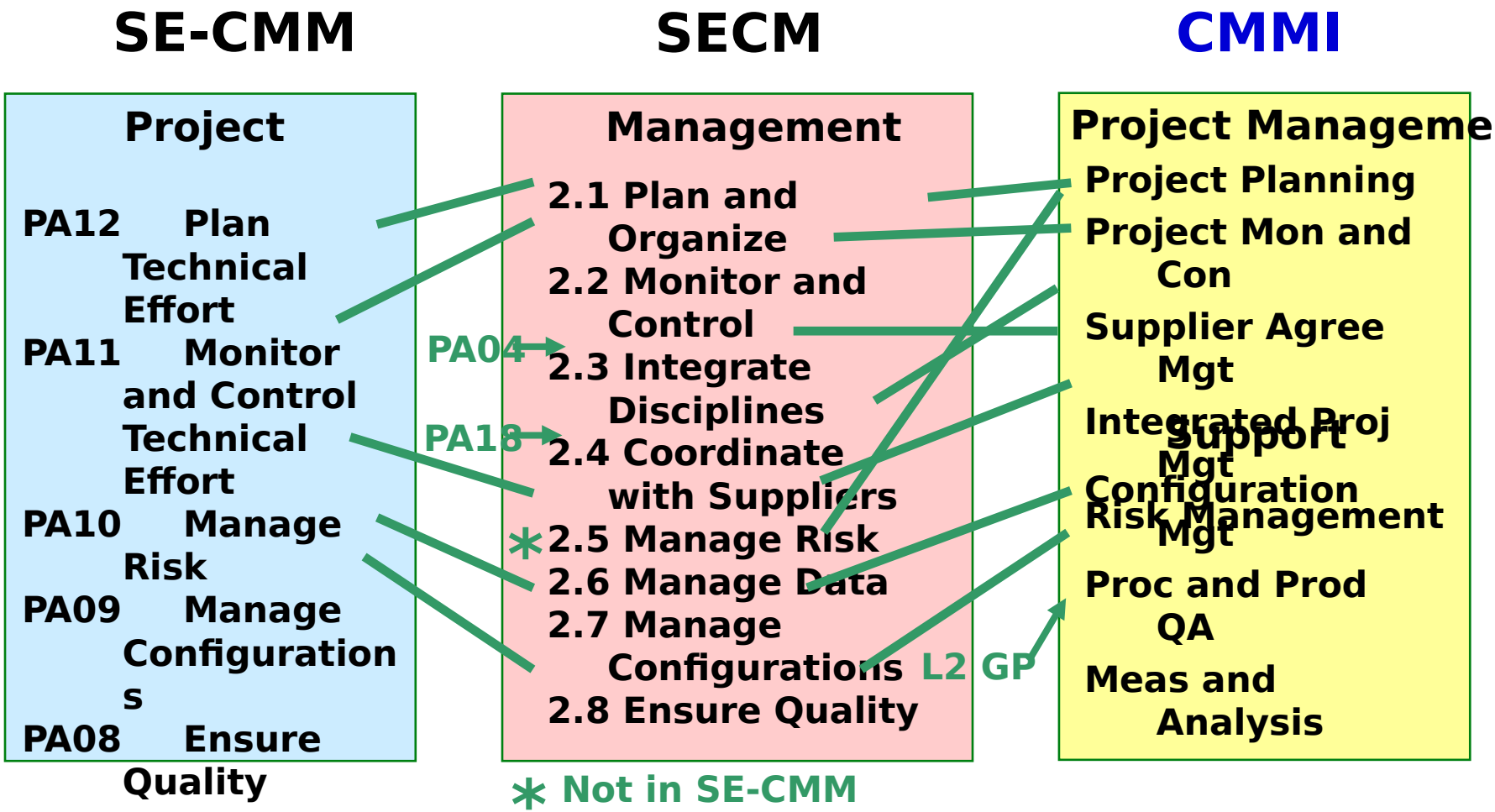
SE-CMM and SECM (EIA/IS 731) vs. CMMI

Common Features - Engineering



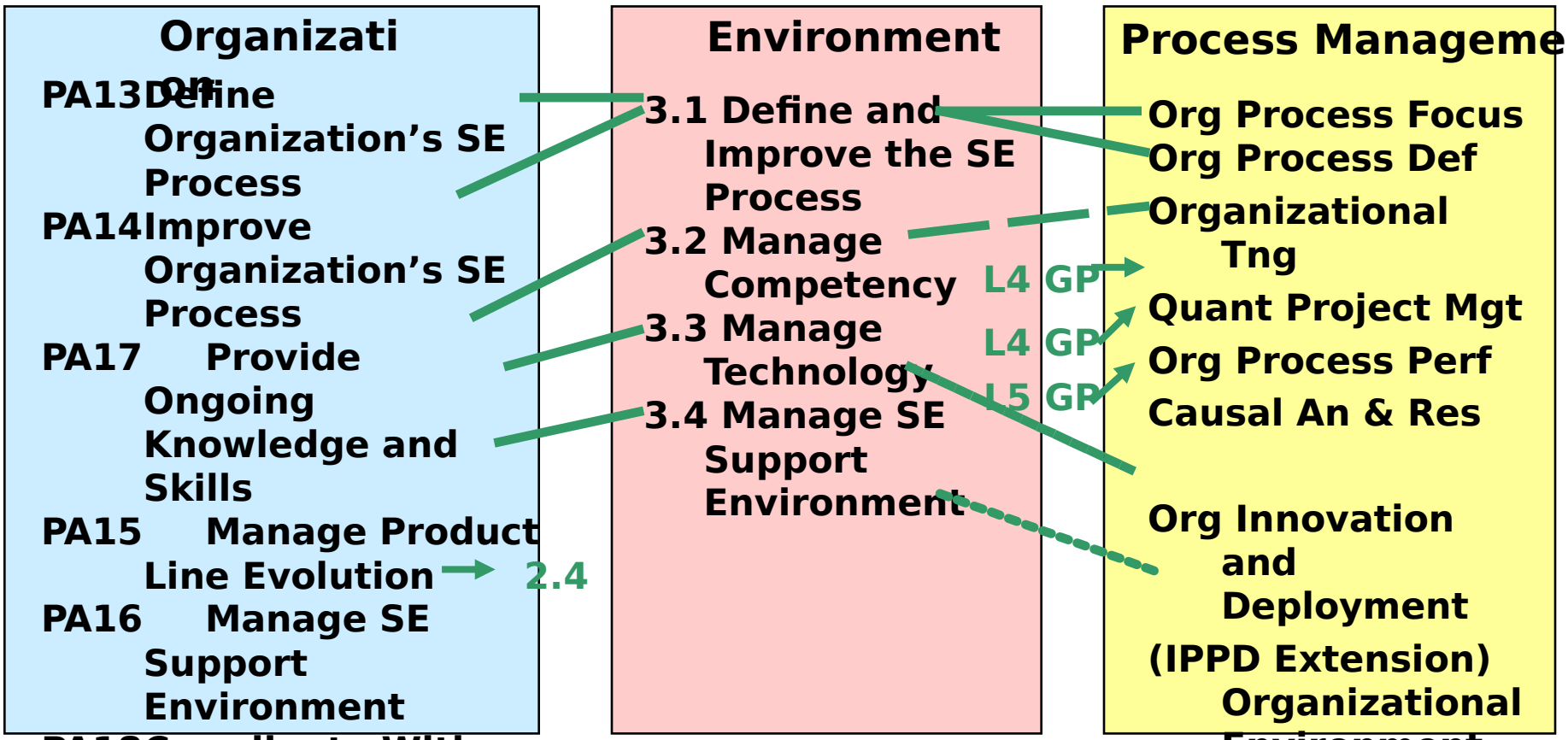
SE-CMM and SECM (EIA/IS 731) vs. CMMI

Common Features - Project Management

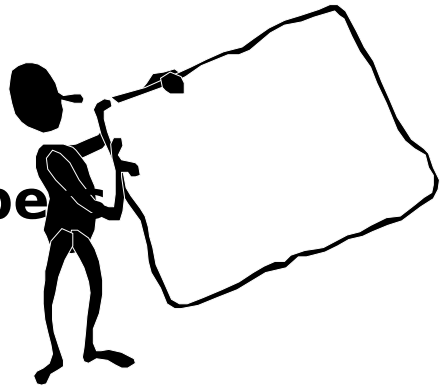


SE-CMM and SECM (EIA/IS 731) vs. CMMI

Common Features - Process Management



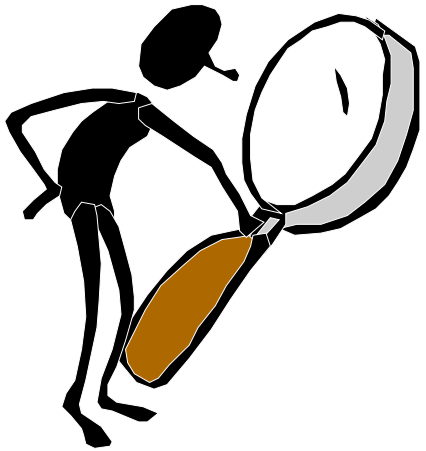
CMMI Assessment Requirements (CAR)



- Similar to the current CMM Appraisal Framework (CAF) V1.0
  - A guide to assessment method developers
- Specifies the requirements for classes of assessment methods
  - Class A: Full, comprehensive assessment methods
  - Class B: Initial, incremental, self-assessments
  - Class C: Quick-look
- Method developers can declare which class their method fits
- Method buyers will understand the implications of the method proposed

Standard CMMI Assessment Method for Process Improvement (SCAMPI)

- A Class A Method
- Similar to CBA IPI method
  - Led by authorized Lead Assessor
  - Tailorable to organization and model scope
  - SEI will continue to compile results
- Rules of evidence have been expanded
- Products:
  - SCAMPI Method Description
- In work
  - Maturity questionnaire, work aids, templates
  - Incorporation of SECM appraisal methods
  - Reducing the cost of assessments

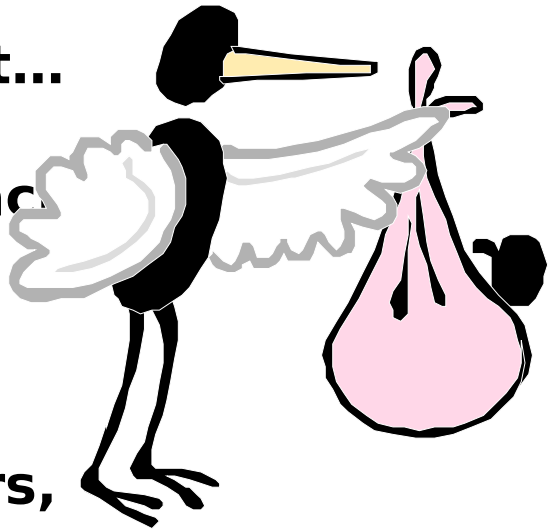


CMMI Lead Assessor Program

- **Similar to existing SEI Lead Assessor and Lead Evaluator programs**
  - **To be administered by SEI**
- **Will transition current SW & SE Lead Assessors**
  - **Specific requirements, steps under discussion**
- **Lead Assessor requirements:**
  - **Introduction to CMMI Training**
  - **Assessment team experience**
  - **Advanced CMMI Training**
  - **SCAMPI Lead Assessor Training or Upgrade Training (for current Lead Assessors)**

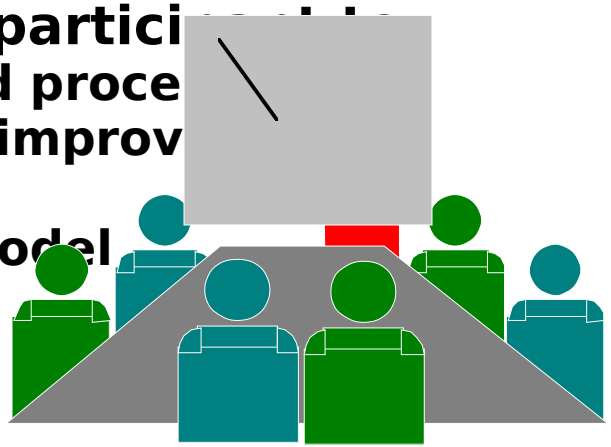
Expectations

- We have simplified the method, but…
  - CMMI models have more process areas and more practices than eac of the individual source models
- Our goal:
  - Assuming an organization of 3-6 projects, 6-9 team members, experienced Lead Assessor
  - SCAMPI assessment of all process areas through Levels 2-5 in 2-3 weeks
  - SCAMPI assessment of process areas through Levels 3 in 1-2 weeks



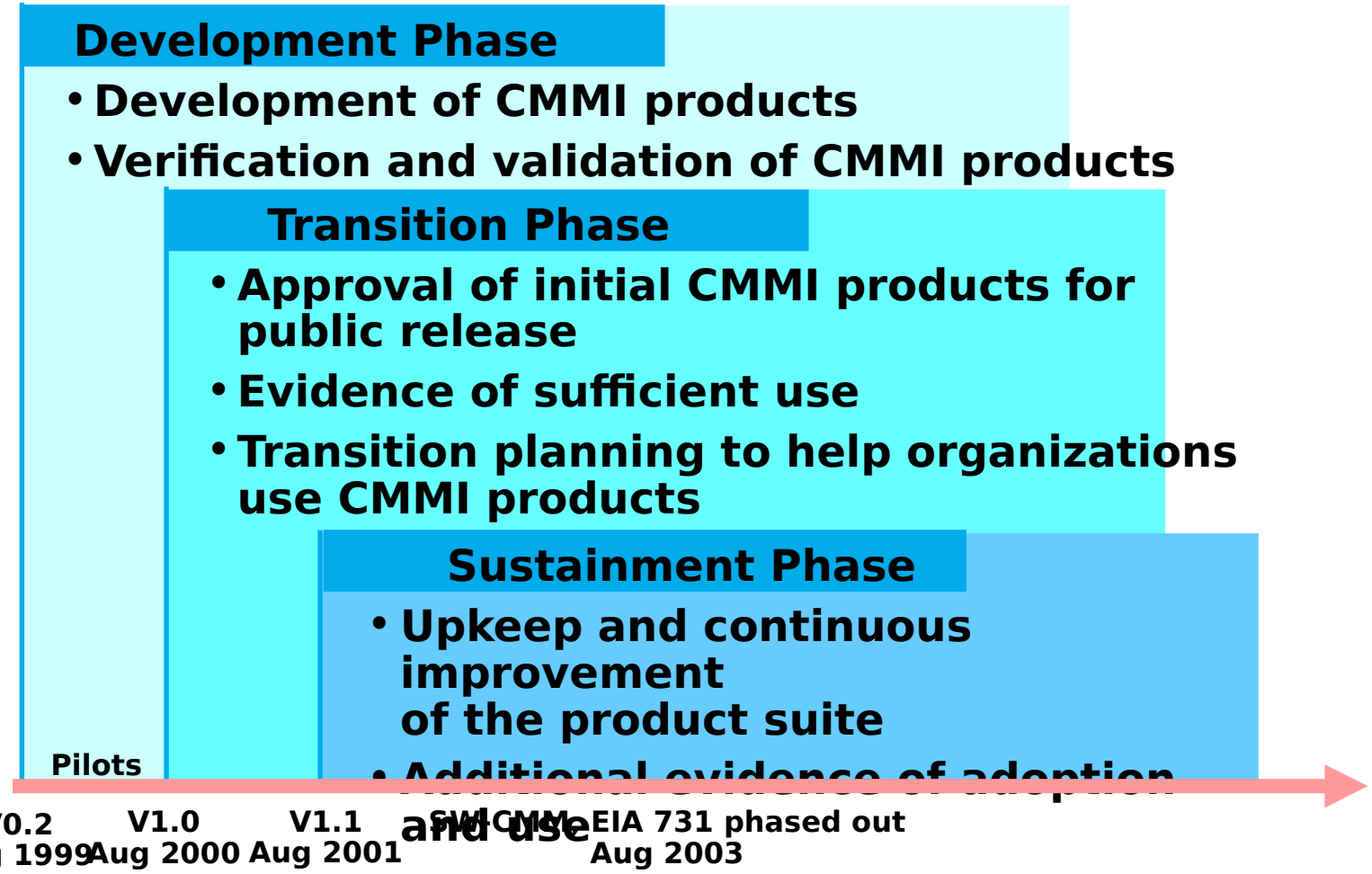
Introduction to the CMMI Course
Staged & Continuous (Separate Courses)

- **Introduction course will enable the partici**
  - **Understand the importance of defined proce**
  - **Understand the rationale for process improv**
  - **Comprehend the CMMI model**
  - **Identify ways of applying the CMMI model for process improvement**



- **Broad audience**
  - **Systems and software developers**
  - **Systems and software managers**
  - **Practitioners of disciplines that support systems and software**
  - **Government and industry acquirers of software-intensive systems**
- **Other courses in development**

CMMI Transition Plan



How Do I Transition My Organization?

- **Decide whether the staged or continuous representation is more appropriate**
- **Decide the scope of the improvement effort**
  - **Software projects only**
  - **Systems engineering projects only**
  - **All projects**
- **Perform an gap analysis of your current practices against the model changes from SW-CMM and/or EIA 731**
  - **New Process Areas**
  - **New Common Features**
  - **New/different practices**
  - ***Do you need a new infrastructure to cover a new discipline?***
  - ***Do you want a comprehensive assessment? Informal/formal?***
- **Set goals, develop a plan, implement the plan, assess progress**

Summary

Organizations that are currently using SW-CMM v1.1 or EIA/IS 731 should be able to smoothly transition

http://www.sei.cmu.edu/cmmi/

- **CMMI Model, SCAMPI Method Description**
- **IPPD Model (when available)**
- **CMMI news, presentations, articles, correspondence**
- **FAQs (Frequently Asked Questions)**
- **CMMI Plans and Schedules**
- **CMMI Transition Plan**